

WHAT IS CLAIMED IS:

1. A method in an access network coupled to a packet data network, where the access network includes a radio access network coupled to a packet-switched access network which includes an access point coupled to a multimedia system that provides multimedia session services, comprising:
  - generating a message requesting a bearer between the mobile terminal and the access point that includes a signaling quality of service (QoS) indicator, and
  - detecting the signaling QoS indicator in the message, and in response, establishing a bearer between the mobile terminal and the access point that supports a pre-established signaling QoS profile.
2. The method in claim 1, further comprising:
  - initiating a multimedia session involving a mobile terminal and a remote host for a plurality of media data streams using the bearer configured with the signaling QoS profile;
3. The method in claim 1, wherein the pre-established signaling QoS profile includes both low delay and low bit error rate quality of service characteristics.
4. The method in claim 3, wherein the pre-established signaling QoS profile further includes high priority and bursty traffic pattern quality of service characteristics.
5. The method in claim 4, wherein the high priority quality of service characteristic permits packets sent over the bearer to take priority over packets sent over bearers having a different QoS profile.
6. The method in claim 1, further comprising:
  - sending session set up signals over the bearer.

7. The method in claim 1, wherein the pre-established signaling QoS profile is used for all signaling bearers.

8. The method in claim 1, wherein the pre-established signaling QoS profile is used selectively for signaling bearers where the signaling QoS indicator is included in the bearer request message.

9. The method in claim 1, wherein the pre-established signaling QoS profile is used for a media packet access bearer if a message requesting a media packet access bearer between the mobile terminal and the access point includes the signaling QoS indicator.

10. The method in claim 1, wherein the pre-established signaling QoS profile is not permitted for media packet access bearers.

11. The method in claim 1, wherein if the signaling QoS indicator is not included in the bearer request message for a signaling bearer, a signaling bearer may be established in accordance with a quality of service profile other than the pre-established signaling QoS profile.

12. The method in claim 1, wherein the pre-established signaling QoS profile is configured in at least some of the nodes in the access network before the session is initiated.

13. The method in claim 1, wherein the pre-established signaling QoS is not determined or negotiated during set up of the session.

14. The method in claim 1, further comprising:  
restricting use of a bearer with the pre-established signaling QoS profile such that only signaling packets are transported over the bearer and traffic packets are blocked from transport over the bearer.

15. The method in claim 13, wherein the restricting is indicated using a signaling usage indicator provided during bearer establishment and is implemented by packet filtering in the access point node.

16. The method in claim 1, further comprising:  
5 identifying a bearer source and a bearer destination, and  
restricting packets transported over the bearer so that packets may only be transported over the bearer from the identified bearer source and to the identified bearer destination.

17. The method in claim 16, wherein the restricting is indicated using a signaling usage indicator and is implemented in the access point node.

18. The method in claim 17, wherein the identified source corresponds a server in a multimedia system in the downlink direction and the identified destination corresponds to the server in a multimedia system in the uplink direction.

19. The method in claim 1, further comprising:  
15 restricting use of a bearer with the pre-established signaling QoS profile by configuring one or both of the mobile terminal and the access point to limit an average data transmission rate over the bearer, wherein if the mobile terminal is so-configured, the mobile terminal limits the average data transmission rate over the bearer for data transmitted from the mobile terminal in an uplink direction and the  
20 access point limits the average data transmission rate over the bearer for data transmitted from the access point in a downlink direction,  
wherein the restriction is activated in response to detection of the signaling QoS indicator.

20. The method in claim 19, further comprising:  
25 restricting use of a bearer with the pre-established signaling QoS profile by configuring one or both of the mobile terminal and the access point to control a flow

of data over the bearer, wherein if the mobile terminal and access point are so-configured, the mobile terminal controls the flow of data over the bearer for data transmitted from the mobile terminal in the uplink direction and the access point controls the flow of data over the bearer for data transmitted from the access point in the downlink direction,

wherein the restriction is activated in response to detection of the signaling QoS indicator.

21. The method according to claim 1, further comprising:  
detecting a signaling usage indicator for the bearer;  
filtering use of the bearer at the access point when the signaling usage indicator is detected; and

the access point informing the mobile terminal about some aspect of the filtering.

22. The method according to claim 20, further comprising:  
configuring nodes in the access network with a standard set of bearer capabilities associated with use of the bearer;  
detecting a signaling usage indicator for the bearer; and  
when the signaling usage indicator is detected, filtering use of the bearer at the access point in accordance with the standard set of bearer capabilities.

23. The method in claim 22, further comprising:  
when the signaling usage indicator is detected, filtering use of the bearer at the access point in accordance with at least one bearer capability in addition to the standard set of bearer capabilities, and  
the access point informing the mobile terminal about some aspect of the policing in accordance with the at least one additional restriction.

24. A method in a universal mobile telecommunications system (UMTS)/general packet radio services (GPRS) network, including a radio network controller (RNC), a serving GPRS support node (SGSN), and a gateway GPRS serving node (GGSN), comprising:

5 generating a PDP context request message requesting a bearer between the mobile terminal and the GGSN, where the PDP context request message includes a signaling quality of service (QoS) indicator, and

detecting the signaling QoS indicator in the PDP context request message, and in response, establishing a bearer between the mobile terminal and the GGSN in accordance with a pre-established signaling QoS profile.

25. The method in claim 24, further comprising:

initiating a multimedia session involving mobile terminal and a remote host for a plurality of media data streams using the bearer with the signaling QoS profile.

26. The method in claim 24, wherein the pre-established signaling QoS profile includes both low delay and low bit error rate quality of service characteristics.

27. The method in claim 26, wherein the pre-established signaling QoS profile further includes high priority and bursty traffic pattern quality of service characteristics.

28. The method in claim 26, wherein the high priority quality of service characteristic permits packets sent over the bearer to take priority over packets sent over bearers having a different QoS profile.

29. The method in claim 24, further comprising:  
sending session set up signals over the bearer.

30. The method in claim 24, wherein the detecting step includes the SGSN and the GGSN detecting the signaling QoS indicator in the PDP context request message, and thereafter, the SGSN sends a radio access bearer request to a radio network controller (RNC) in the UTRAN for a radio access bearer (RAB) configured to support the signaling QoS profile.

31. The method in claim 30, wherein the RNC sends a radio bearer setup request to the mobile terminal requesting a transport format associated with the signaling QoS profile.

32. The method in claim 30, wherein the RNC and the SGSN store a previously-configured per hop handling associated with the signaling QoS profile for the established bearer.

33. The method in claim 30, wherein the GGSN stores a previously-configured per hop handling associated with the signaling QoS profile for the established bearer.

34. The method in claim 24, wherein the pre-established signaling QoS profile is used for all signaling bearers.

35. The method in claim 24, wherein the pre-established signaling QoS profile is used selectively for signaling bearers where the signaling QoS indicator is included in the PDP context request message.

36. The method in claim 24, wherein the pre-established signaling QoS profile is used for a media packet access bearer if a PDP context request message requesting a media packet access bearer between the mobile terminal and the GGSN includes the signaling QoS indicator.

37. The method in claim 24, wherein the pre-established signaling QoS profile is not permitted for media packet access bearers.

38. The method in claim 24, wherein if the signal QoS indicator is not included in the PDP context request message for a signaling bearer, the signaling bearer may be established in accordance with a quality of service profile other than the pre-established signaling QoS profile.

5 39. The method in claim 24, wherein the pre-established signaling QoS profile is configured the RNC, the SGSN, and the GGSN before the session is initiated.

40. The method in claim 24, wherein the pre-established signaling QoS is not determined or negotiated during set up of the session.

10 41. The method in claim 24, further comprising:  
restricting use of a bearer with the pre-established signaling QoS profile such that only signaling packets are transported over the bearer and traffic packets are blocked from transport over the bearer.

15 42. The method in claim 41, wherein the restricting is indicated using a signaling usage indicator in a protocol configuration options (PCO) parameter associated with the PDP context request and is implemented by packet filtering in the GGSN.

20 43. The method in claim 24, further comprising:  
identifying a bearer source and a bearer destination, and  
restricting packets transported over the bearer so that packets may only be transported over the bearer from the identified bearer source and to the identified bearer destination.

25 44. The method in claim 43, wherein the restricting is implemented in the GGSN when the GGSN detects a signaling usage indicator in the PDP request message,

wherein the identified source corresponds a server in a multimedia system coupled to the GGSN in the downlink direction, and

wherein the identified destination corresponds to the server in the multimedia system in the uplink direction.

45. The method in claim 24, further comprising:

restricting use of a bearer with the pre-established signaling QoS profile by configuring one or both of the mobile terminal and the GGSN to limit an average data transmission rate over the bearer,

wherein if the mobile terminal is so-configured, the mobile terminal limits the average data transmission rate over the bearer for data transmitted from the mobile terminal in the uplink direction,

wherein if the GGSN is so-configured, the GGSN limits the average data transmission rate over the bearer for data transmitted from the access point in the downlink direction, and

wherein the restriction is activated using the signaling QoS indicator.

46. The method in claim 24, further comprising:

restricting use of a bearer with the pre-established signaling QoS profile by configuring one or both of the mobile terminal and the GGSN to control a flow of data over the bearer,

wherein if the mobile terminal is so-configured, the mobile terminal controls the flow of data over the bearer for data transmitted from the mobile terminal in the uplink direction,

wherein if the GGSN is so-configured, in response to detection of GGSN controls the flow of data over the bearer for data transmitted from the access point in the downlink direction, and

wherein the restriction is activated in response to detection of the signaling QoS indicator.



47. The method according to claim 24, further comprising:  
 detecting a signaling usage indicator for the bearer;  
 when the signaling usage indicator is detected, filtering use of the bearer at the  
 GGSN; and  
 5 the GGSN informing the mobile terminal about some aspect of the filtering.

48. The method according to claim 24, further comprising:  
 configuring the GGSN with a standard set of bearer capabilities associated  
 with use of the bearer;  
 detecting a signaling usage indicator for the bearer; and  
 10 when the signaling usage indicator is detected, filtering use of the bearer at the  
 GGSN in accordance with the standard set of bearer capabilities.

49. The method in claim 48, further comprising:  
 when the signaling usage indicator is detected, filtering use of the bearer at the  
 GGSN in accordance with at least one bearer capability in addition to the standard  
 15 set of bearer capabilities, and  
 the GGSN informing the mobile terminal about some aspect of the filtering in  
 accordance with the at least one additional capability.

50. A communications system comprising:  
 a mobile terminal and a remote host configured for communication with a  
 20 packet data network (PDN);  
 a radio access network (RAN) node for communicating with the mobile  
 terminal over a radio interface;  
 a multimedia system node for providing multimedia session services;  
 a packet-switched access network (PSAN) node coupled to the RAN node, the  
 25 PDN, and the multimedia system node,  
 wherein one or more of the nodes is configured to detect a signaling quality of  
 service (QoS) indicator in a bearer request message and to assist in establishing a

bearer between the mobile terminal and the PSAN node that supports a pre-established signaling QoS profile.

51. The communications system in claim 50, wherein the pre-established signaling QoS includes both low delay and low bit error rate quality of service characteristics.

52. The communications system in claim 51, wherein the pre-established signaling QoS profile further includes high priority and bursty traffic pattern quality of service characteristics.

53. The communications system in claim 52, wherein the high priority quality of service characteristic permits packets sent over the bearer to take priority over packets sent over bearers with a different QoS profile.

54. The communications system in claim 50, wherein the pre-established signaling QoS profile is used for all signaling bearers.

55. The communications system in claim 50, wherein the pre-established signaling QoS profile is used selectively for signaling bearers where the signaling QoS indicator is included in the bearer request message.

56. The communications system in claim 50, wherein the RAN node is a radio network controller (RNC) the PSAN node is a gateway GPRS serving node (GGSN).

57. The communications system in claim 56, wherein the pre-established signaling QoS profile is used for a media packet access bearer if the bearer request message requesting a media packet access bearer between the mobile terminal and the GGSN includes the signaling QoS indicator.

58. The communications system in claim 50, wherein the pre-established signaling QoS profile is not permitted for media packet access bearers.

59. The communications system in claim 50, wherein the pre-established signaling QoS profile is configured in each node before the session is initiated.

5 60. The communications system in claim 50, wherein the pre-established signaling QoS is not determined or negotiated during set up of the session.

61. The communications system in claim 50, wherein the PSAN node includes one or more filters to restrict use of a bearer with the pre-established signaling bearer QoS profile so that only signaling packets are transported over the bearer and traffic packets are blocked from transport over the bearer by the one or  
10 more filters.

62. The communications system in claim 61, wherein the restriction is indicated using a signaling usage indicator associated with the bearer request.

63. The communications system in claim 50, wherein a bearer source in  
15 and a bearer destination are identified in the PSAN node, and the PSAN node is configured to detect a signaling usage indicator in the bearer request, and in response, to restrict packets transported over the bearer so that packets may only be transported over the bearer from the identified bearer source and to the identified bearer destination.

20 64. The communications system in claim 63, wherein the identified source corresponds to the multimedia system node in the downlink direction and the identified destination corresponds the multimedia system node in the uplink direction.

65. The communications system in claim 64, wherein the bearer is restricted to a signaling bearer which is only permitted to transport signaling information.

66. The communications system according to claim 50, wherein the PSAN node is further configured to :

detect a signaling usage indicator for the bearer;  
 filtering use of the bearer at the PSAN node when the signaling usage indicator is detected; and  
 inform the mobile terminal about some aspect of the filtering.

67. The communications system according to claim 50, wherein the PSAN node is further configured to:

configure the GGSN with a standard set of bearer capabilities;  
 detect a signaling usage indicator for the bearer;  
 filter use of the bearer at the PSAN node in accordance with the standard set of bearer capabilities when the signaling usage indicator is detected.

68. The communications system in claim 67, wherein the PSAN node is configured to filter use of the bearer in accordance with at least one bearer capability in addition to the standard set of bearer capabilities and to inform the mobile terminal about some aspect of the filtering in accordance with the at least one additional bearer capability when the signaling usage indicator is detected.

69. For use in a universal mobile telecommunications system (UMTS)/general packet radio services (GPRS) network that includes a radio network controller (RNC), a serving GPRS support node (SGSN), and a gateway GPRS serving node (GGSN), the GGSN comprising:

means for storing a pre-established signaling QoS profile;

means for receiving a PDP context request message requesting a bearer between the mobile terminal and the GGSN;

means for detecting whether the PDP context request message includes a signaling quality of service (QoS) indicator; and

5 means for assisting in establishing a bearer between the mobile terminal and the GGSN in accordance with the pre-established signaling QoS profile.

70. The GGSN in claim 69, further comprising:

means for restricting use of the bearer with the signaling QoS such that only signaling packets are transported over the bearer and traffic packets are blocked from transport over the bearer.

71. The GGSN in claim 69, wherein means for detecting detects a whether signaling usage indicator is included in a protocol configuration options (PCO) parameter associated with the PDP context request, the GGSN further comprising a means for restricting packets over the bearer in accordance with the signaling usage indicator.

72. The GGSN in claim 71, further comprising:

means for identifying a bearer source and a bearer destination,

wherein the means for restricting restricts packets transported over the bearer so that packets may only be transported over the bearer from the identified bearer source and to the identified bearer destination.

73. The GGSN in claim 69, further comprising:

means for restricting use of the bearer in response to with the signaling QoS indicator to an average data transmission rate over the bearer.

74. The method in claim 69, further comprising:

25 means for restricting use of the bearer in response to the signaling QoS indicator to control a flow of data over the bearer.

75. The GGSN according to claim 69, further comprising:  
means for detecting a signaling usage indicator for the bearer;  
means filtering use of the bearer; and  
means for informing the mobile terminal about some aspect of the filtering.

5 76. The GGSN according to claim 69, wherein the means for storing stores  
a standard set of bearer capabilities associated with use of the bearer, further  
comprising:

means for detecting a signaling usage indicator for the bearer, and  
means for filtering use of the bearer at the GGSN in accordance with the  
10 standard set of bearer capabilities.

77. The GGSN in claim 76, wherein the means for filtering filters use of  
the bearer at the GGSN in accordance with at least one bearer capability in addition  
to the standard set of bearer capabilities, further comprising:

means for informing the mobile terminal about some aspect of the filtering in  
15 accordance with the at least one additional capability.